Claims

1.   An energy saving method of assigning elevator cars to answer hall calls, comprising:

calculating an average wait time (23) for passengers to have their request for service subsequent to entering a hall call over either (a) a recent number of calls or (b) a recent extent of time;

characterized by:

if said average wait time is less than a wait time lower limit (24), determining (31-34) if there is a car with no demand, and in that event either (c) setting a flag (39) to cause said car to become parked and to be excluded from answering hall calls, or (d) calculating (45) an additional parameter indicative of recent traffic level, and if said parameter is below a lower limit thereof (45), setting a flag (48) to cause said car to shut down with its drive off;

if said average wait time is more than a wait time upper limit (90) and a parked car (91) can answer a current hall call request in less than a maximum remaining response time (110), (e) assigning said current hall call (118) to said parked car and causing (116) said parked car to enter full service, or if there is no parked car (91) but there is a car that has been shut down (92) and said shut down car can answer said current hall call with a remaining response time (RRT) which is less than the maximum RRT (110) by a penalty amount (119), then (f) if not all of the cars are shut down (115), assigning said current hall call to said shut down car (118), and starting said car (117) so as to return it to full service, (g) if all of said cars are shut down (115), entering into a delay period (121-124) during which all of the acceptable (128) RRTs for all calls that are entered for assignment during the delay period for each of the cars are stored (129), and after the delay period, selecting (145, 149, 150, 156, 159) a car which has the lowest maximum RRT, among all the calls to be assigned which are less than the upper RRT limit, to answer all of the calls which can be assigned to it with less than the RRT upper limit, and restarting (167) said car and putting said car in service to answer all of said calls and to remain in full service;

if said average wait time is not more than said wait time upper limit, assigning a specific hall call to a specific car having the lowest RRT to said specific hall call (103-106) unless said specific car is down running (95) and said specific call can be answered (83) by an up running car (82) with an RRT less than maximum (77).

2. An energy saving method of assigning elevator cars to answer hall calls, comprising:

calculating an average wait time (23) for passengers to have their request for service subsequent to entering a hall call over either (a) a recent number of calls or (b) a recent extent of time;

characterized by:

if said average wait time is less than a wait time lower limit (24), determining (31-34) if there is a car with no demand, and in that event either (c) setting a flag (39) to cause said car to become parked and to be excluded from answering hall calls, or (d) calculating (45) an additional parameter indicative of recent traffic level, and if said parameter is below a lower limit thereof (45), setting a flag (48) to cause said car to shut down with its drive off.

3. An energy saving method of assigning elevator cars to answer hall calls, comprising:

calculating an average wait time (23) for passengers to have their request for service subsequent to entering a hall call over either (a) a recent number of calls or (b) a recent extent of time;

characterized by:

if said average wait time is less than a wait time lower limit (24), determining (31-34) if there is a car with no demand, and in that event setting a flag (39) to cause said car to become parked and to be excluded from answering hall calls;

if said average wait time is more than a wait time upper limit (90) and a parked car (91) can answer a current hall call request in less than a maximum remaining response time (110), assigning said car (118) to said parked car and causing (116) said parked car to enter full service.

4. An energy saving method of assigning elevator cars to answer hall calls, comprising:

calculating an average wait time (23) for passengers to have their request for service subsequent to entering a hall call over either (a) a recent number of calls or (b) a recent extent of time;

characterized by:

if said average wait time is less than a wait time lower limit (24), determining (31-34) if there is a car with no demand, and in that event calculating (45) an additional parameter indicative of recent traffic level, and if said parameter is below a lower limit thereof (45), setting a flag (48) to cause said car to shut down with its drive off;

if said average wait time is more than a wait time upper limit (90) and there is a car that has been shut down (92) and said shut down car can answer a hall call currently being assigned with a remaining response time (RRT) which is less than the maximum RRT (110) by a penalty amount (119), then assigning said call to said shut down car (118), and starting said car (117) so as to return it to full service.

5.   An energy saving method of assigning elevator cars to answer hall calls, comprising:

calculating an average wait time (23) for passengers to have their request for service subsequent to entering a hall call over either (a) a recent number of calls or (b) a recent extent of time;

characterized by:

if said average wait time is less than a wait time lower limit (24), determining (31-34) if there is a car with no demand, and in that event calculating (45) an additional parameter indicative of recent traffic level, and if said parameter is below a lower limit thereof (45), setting a flag (48) to cause said car to shut down with its drive off;

if said average wait time is more than a wait time upper limit (90) there is a car that has been shut down (92) and said shut down car can answer a hall call currently being assigned with a remaining response time (RRT) which is less than the maximum RRT (110) by a penalty amount (119), then (a) if not all of the cars are shut down (115), assigning said call to said shut down car (118), and starting said car (117) so as to return it to full service, (b) if all of said cars are shut down (115), entering into a delay period (121-124) during which all of the acceptable (128) RRTs for all calls that are entered for assignment during the delay period for each of the cars are stored (129), and after the delay period, selecting (145, 149, 150, 156, 159) a car which has the lowest maximum RRT, among all the calls to be assigned which are less than the upper RRT limit, to answer all of the calls which can be assigned to it

with less than the RRT upper limit, and restarting (167) said car and putting said car in service to answer all of said calls and to remain in full service.

      6.   An energy saving method of assigning elevator cars to answer hall calls, comprising:

      calculating an average wait time (23) for passengers to have their request for service subsequent to entering a hall call over either (a) a recent number of calls or (b) a recent extent of time;

      characterized by:

      if said average wait time is not more than said wait time upper limit, assigning a specific hall call to a specific car having the lowest RRT to said specific hall call (103-106) unless said specific car is down running (95) and said specific call can be answered (83) by an up running car (82) with an RRT less than maximum (77).